PATENT ABSTRACTS OF JAPAN

(11)Publication number : **07-183629**
(43)Date of publication of application : **21.07.1995**

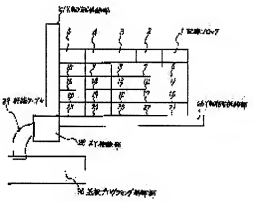
(51)Int.Cl. H05K 1/02
H05K 1/11

(21)Application number : **05-329145**
(22)Date of filing : **24.12.1993**

(71)Applicant : **NEC CORP**
(72)Inventor : **SASAKI YOSHIHIRO**

(54) UNIVERSAL BOARD

(57)Abstract:
PURPOSE: To easily enlarge the scale of a circuit within the range where it can be connected to an X-axis signal feeder and a Y-axis signal feeder, in the case that the necessity to add a circuit occurs, by connecting blocks, where electronic circuit elements are mounted, in a matrix shape.
CONSTITUTION: When a board programming controller 30 designates the XY location of a wiring block, an X-axis signal feeder 27 turns on the address signal line in the direction of X axis where the wiring block in the location of corresponding X axis is connected, and a Y-axis signal feeder 26 turns on the address signal line in the direction of Y axis where the wiring block in the location of corresponding Y axis is connected. Hereby, only one wiring block where both the address signal line in the direction of X axis and the address signal line in the direction of Y axis are turned on is specified, among several wiring blocks 1-25. The function as one board can be materialized in the whole of the wiring blocks 1-25 in matrix shape by specifying wiring changeover data to all wiring blocks.



LEGAL STATUS

[Date of request for examination]	12.08.1994
[Date of sending the examiner's decision of rejection]	
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	2526518
[Date of registration]	14.06.1996
[Number of appeal against examiner's decision of rejection]	

[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	14.06.2000

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] (A) Two or more wiring blocks which have four connectors on four side faces, and are connected in the shape of a matrix, (B) The X-axis minus side connector which is located in the side face of the X-axis minus direction of said wiring block, and connects with said other wiring blocks or a signal feed zone, (C) The X-axis plus side connector which is located in the side face of the X-axis plus direction of said wiring block, and connects with said other wiring blocks, (D) The Y-axis minus side connector which is located in the side face of the Y-axis minus direction of said wiring block, and connects with said other wiring blocks or a Y-axis signal feed zone, (E) The Y-axis plus side connector which is located in the side face of the Y-axis plus direction of said wiring block, and connects with said other wiring blocks, (F) The IC socket which is located in said wiring block top face, and mounts electronic-circuitry components, such as IC, (G) The matrix switch section which is the set of the switch which is located in the interior of said wiring block, and switches connection of a general-purpose signal line, (H) The X-axis minus side general-purpose signal-line group which are two or more general-purpose signal lines which were located in the interior of said wiring block, connected one side to said matrix switch section, have already connected one side to an X-axis minus side connector, and transmit a signal among said other wiring blocks, (I) The X-axis plus side general-purpose signal-line group which are two or more general-purpose signal lines which were located in the interior of said wiring block, connected one side to said matrix switch section, have already connected one side to an X-axis plus side connector, and transmit a signal among said other wiring blocks, (J) The Y-axis minus side general-purpose signal-line group which are two or more general-purpose signal lines which were located in the interior of said wiring block, connected one side to said matrix switch section, have already connected one side to a Y-axis minus side connector, and transmit a signal among said other wiring blocks, (K) The Y-axis plus side general-purpose signal-line group which are two or more general-purpose signal lines which were located in the interior of said wiring block, connected one side to said matrix switch section, have already connected one side to a Y-axis plus side connector, and transmit a signal with a feeling with said other wiring blocks, (L) The IC socket side general-purpose signal-line group which are two or more general-purpose signal lines with which it is located in the interior of said wiring block, one side is connected to said matrix switch section, and one side already transmits a signal between said wiring blocks and IC sockets, (M) The switch register section which is located in the interior of said wiring block, and sets up and holds the change of the matrix switch section, (N) The wiring block control section which performs control which is located in the interior of said wiring block, and receives the setting information on the switch register section from a substrate programming control section, (O) The control bus which is in said wiring block, connects with said wiring block control section through an X-axis minus side connector, and transmits a control signal to said two or more wiring blocks of X shaft orientations through an X-axis plus side connector further, (P) The data bus which is in said wiring block, connects with said wiring block control section through an X-axis minus side connector, and transmits a data signal to said two or more wiring blocks of X shaft orientations through an X-axis plus side connector further, (Q) X shaft-orientations address signal line

which is in said wiring block, connects with said wiring block control section through an X-axis minus side connector, and transmits an address signal to said two or more wiring blocks of X shaft orientations through an X-axis plus side connector further, (R) Y shaft-orientations address signal line which is in said wiring block, connects with said wiring block control section through a Y-axis minus side connector, and transmits an address signal to said two or more wiring blocks of Y shaft orientations through a Y-axis plus side connector further, (S) The switch change signal-line group which it is in said wiring block, one side is connected to said matrix switch section, and one side already connects with said wiring block control section, and transmits the control signal of a switch, (T) The X-axis signal feed zone which transmits said control bus signal and data bus signal, and X shaft-orientations address signal to each wiring block which connects with the edge of the X-axis minus direction of said wiring block, and is connected, (U) The Y-axis signal feed zone which transmits Y shaft-orientations address signal to each wiring block which connects with the edge of the Y-axis minus direction of said wiring block, and is connected, (V) XY connection which connects said X-axis signal feed zone and a Y-axis signal feed zone, (W) Universal board characterized by including the substrate programming control section which sets up connection inside said wiring block each, and the interconnection cable which connects said XY connection and a substrate programming control section at the time of a setup of the (X) aforementioned wiring block.

[Translation done.]

.

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to a universal board and the universal board which carries out additional arrangement of the circuit element freely, and can be connected especially.
[0002]
[Description of the Prior Art] The circuit pattern of the mounting substrate to which it comes to carry two or more ICs can be created by CAD based on a circuit diagram -> wiring list. In this case, although the wiring Ruhr whose cross talk decreases is developed The optimal arrangement of each IC which can attain connection necessary within the substrate of a regular dimension is essentially calculated. It is making into main problems in what kind of path to connect between the pins of each IC electrically, and even if it manufactures a printed wiring base as CAD data and carries each IC in it, there is no guarantee that the target engine performance can be demonstrated. However, cost and time amount are manufacturing the printed wiring substrate for evaluation with a huge thing, and the burden cannot be borne. Then, the appearance of a universal board (omnipotent printed wiring substrate) is expected.
[0003] A Prior art is explained to a detail with reference to a drawing.
[0004] Drawing 3 (a) and (b) are the side elevations and rear-face Figs. showing the 1st conventional example. The substrate 101 shown in drawing 3 (a) and (b) is constituted including the omnipotent pattern 114 and the terminal 111 for (B) power sources which can insert the socket 102 of (A) various kinds which carries out IC correspondence, the terminal 112 for signals, and the terminal 113 for touch-down. (For example, refer to JP,4-204392,A)
It is only one piece carried in a substrate 101, and the number of pins and electrical characteristics are free. That is, it is developed as an IC circuit tester. The socket 102 from which the through hole 115 is only arranged in the shape of a grid, and, as for the omnipotent pattern 114, a form is different is attached freely. The terminal 111 for power sources is connected to the terminal of a socket 102 by lead-wire 108A, the terminal 112 for signals is connected to the terminal of a socket 102 by lead-wire 108B, and the terminal 113 for touch-down is connected to the terminal of a socket 102 by lead-wire 108C.
[0005] When IC103 operates, the supply voltage of IC103 is changed, or a pulse-like noise occurs, and it becomes impossible to inspect on right conditions, since wiring from IC circuit tester's power source to a socket 102 has an inductance and resistance. For this reason, the capacitor 107 for decoupling is attached to IC103 between the terminal of the socket 102 corresponding to a power supply terminal, and an earth terminal 113.
[0006] In order to enable it to correspond a substrate 101 also to IC103 from which a class is different, the omnipotent pattern 114 must be enlarged. If it does so, the lead wire which connects a surrounding terminal and the surrounding omnipotent pattern 114 becomes long, the I/O wave of IC103 will deteriorate or a ringing will occur. Supply voltage and touch-down potential are changed with the RINDAKU wardrobe of the lead wire of lead-wire 108C or a capacitor 107 especially connected to the earth terminal of IC103, and an exact inspection becomes impossible.
[0007] Drawing 4 (a) and (b) are the side elevations and rear-face Figs. explaining the amelioration

technique of the substrate 101 shown in drawing 3 (a) and (b). The omnipotent pattern 114 is covered to a substrate 101, and touch-down pattern 104B in which power-source pattern 104C and touch-down pattern 104B are formed is added.

[0008] Drawing 5 is the block diagram showing the 2nd conventional example. The testing device shown in drawing 4 is constituted including (A) trial control section 201, the (B) relays r1-r3, and the (C) resonance circuit 208 and a capacitor 209. (For example, refer to JP,4-169873,A)

In order that this may check the special function which it has for every integrated circuit, the specific measurement performed in the condition of having combined with the circuit with outside is also included. In order to carry out the check of the PLL circuit in a device under test 207 of operation, the trial control section 201 supplies test signal St to a device under test 207 from CPU according to a test program. In addition, the supply voltage Vd impressed to a device under test 207 is also supplied from the trial control section 201.

[0009] Drawing 6 (a) - (c) is the block diagram showing the example of use of the testing device shown in drawing 5 . Drawing 6 (a) shows a trial in the condition that no circuits with outside are connected, drawing 6 (b) shows a trial in the condition that the resonance circuit 208 was connected, and drawing 6 (c) shows a trial in the condition that the resonance circuit 208 and the capacitor 209 were connected.

[0010] In adding a new trial to a device under test 207, there is the need for the addition of a relay etc., modification, and a test program of changing. Since numbers, such as a relay which can operate independently, will be restricted by the number (30 [for example,]) of the relay control line from IC circuit tester, the trial of IC with a complicated function cannot fully be performed.

[0011] Drawing 7 is the block diagram showing what improved the testing device shown in drawing 5 . The trial control section 201 shown in drawing 5 is constituted by the IC circuit tester 210 which has CPU211. Furthermore, the relay group 230 by which much relays were arranged as the change section is attached in the shape of a measurement board. The change control section 204 consists of a decoder 205 which outputs the decoding signal which decodes the assignment code from the IC circuit tester 210, and shows the classification of trial system of measurement, and OR circuit 206 which generates the control signal of the relay group 230 by two or more logical elements based on the decoding signal from a decoder 205.

[0012] Drawing 8 is the block diagram showing the 3rd conventional example. The complex computer system shown in drawing 8 is constituted including the (A) matrix switch 350, the processors 310-319 connected to a matrix switch 350 through the (B) bus line 320,329, and the storage 340-349 connected to processors 310-319 through the (C) matrix switch 350. (For example, refer to 1420 pages and drawing 7 (d) in an electronic communication link handbook and Showa 60)

The matrix switch 350 has realized association with the sufficient effectiveness in which versatility is high, using the switch mechanism of a crossbar mold. The present age can permute now processors 310-319 and storage 340-349 by one LSI, respectively. That is, it has suggested that the practical evaluation of a system used as an implementation plug is possible by the wiring circuit board in which the bus line etc. was prepared, saying two or more IC sockets and the switch mechanism of a crossbar mold. However, it is supposed that a problem is such a system in economical efficiency and dependability from the former. And it is applicable only to IC which can connect without special (interface etc.) processing with a bus line.

[0013] Drawing 9 (a) - (c) is the plan showing the 4th conventional example, a side elevation, and a sectional view. Drawing 9 (a) the multi-wire patchboard shown in - (c) (A) Adhesive insulation resin 403 is made to spread and adhere to the front face of an insulating substrate 405. (B) Pre-insulation copper-wire 404 which carried out wiring of the pre-insulation copper wire 404 with the automatic wiring machine, and were embedded into (C) adhesive property insulation resin 403 Or after all wiring ends the electrical installation of the pre-insulation copper wire 404 and the printed wiring pattern 406, it is manufactured by carrying out by forming a through hole 407. (For example, refer to JP,56-40297,A)

The multi-wire patchboard 401 can cross in respect of wiring with the same electric wires. A redundant circuit pattern is not generated, and if it is used in development of the electronic equipment which modification for a circuit, the design mistake of a circuit pattern, or an improvement tends to produce,

and a prototype phase, it will not take the time and effort of a modification design. Densification of about [not needing artworks which were the manufacture top need for a printed wiring substrate, such as a subject copy and a photograph,], and practical use is made easy, and it contributes to the improvement of cost par FOMANSU in multi-form small amount production. It is good if a printed wiring substrate with a circuit pattern with the good track record of operation which evaluated in the prototype phase using the multi-wire patchboard in the case of small painting kind high production, began in the mass-production phase, and was acquired with the multi-wire patchboard manufactures. That is, it was thought that the approach of using a multi-wire patchboard was the realistic means which can reply to the specification demanded as a universal board in order to satisfy the price of a final product and time for delivery.

[0014]

[Problem(s) to be Solved by the Invention] The Prior art mentioned above had the fault that expansion of the scale of a circuit was not easy.

[0015]

[Means for Solving the Problem] Two or more wiring blocks which the universal board of this invention has a (A)4 ** connector on four side faces, and are connected in the shape of a matrix, (B) The X-axis minus side connector which is located in the side face of the X-axis minus direction of said wiring block, and connects with said other wiring blocks or a signal feed zone, (C) The X-axis plus side connector which is located in the side face of the X-axis plus direction of said wiring block, and connects with said other wiring blocks, (D) The Y-axis minus side connector which is located in the side face of the Y-axis minus direction of said wiring block, and connects with said other wiring blocks or a Y-axis signal feed zone, (E) The Y-axis plus side connector which is located in the side face of the Y-axis plus direction of said wiring block, and connects with said other wiring blocks, (F) The IC socket which is located in said wiring block top face, and mounts electronic-circuitry components, such as IC, (G) The matrix switch section which is the set of the switch which is located in the interior of said wiring block, and switches connection of a general-purpose signal line, (H) The X-axis minus side general-purpose signal-line group which are two or more general-purpose signal lines which were located in the interior of said wiring block, connected one side to said matrix switch section, have already connected one side to an X-axis minus side connector, and transmit a signal among said other wiring blocks, (I) The X-axis plus side general-purpose signal-line group which are two or more general-purpose signal lines which were located in the interior of said wiring block, connected one side to said matrix switch section, have already connected one side to an X-axis plus side connector, and transmit a signal among said other wiring blocks, (J) The Y-axis minus side general-purpose signal-line group which are two or more general-purpose signal lines which were located in the interior of said wiring block, connected one side to said matrix switch section, have already connected one side to a Y-axis minus side connector, and transmit a signal among said other wiring blocks, (K) The Y-axis plus side general-purpose signal-line group which are two or more general-purpose signal lines which were located in the interior of said wiring block, connected one side to said matrix switch section, have already connected one side to a Y-axis plus side connector, and transmit a signal with a feeling with said other wiring blocks, (L) The IC socket side general-purpose signal-line group which are two or more general-purpose signal lines with which it is located in the interior of said wiring block, one side is connected to said matrix switch section, and one side already transmits a signal between said wiring blocks and IC sockets, (M) The switch register section which is located in the interior of said wiring block, and sets up and holds the change of the matrix switch section, (N) The wiring block control section which performs control which is located in the interior of said wiring block, and receives the setting information on the switch register section from a substrate programming control section, (O) The control bus which is in said wiring block, connects with said wiring block control section through an X-axis minus side connector, and transmits a control signal to said two or more wiring blocks of X shaft orientations through an X-axis plus side connector further, (P) The data bus which is in said wiring block, connects with said wiring block control section through an X-axis minus side connector, and transmits a data signal to said two or more wiring blocks of X shaft orientations through an X-axis plus

side connector further, (Q) X shaft-orientations address signal line which is in said wiring block, connects with said wiring block control section through an X-axis minus side connector, and transmits an address signal to said two or more wiring blocks of X shaft orientations through an X-axis plus side connector further, (R) Y shaft-orientations address signal line which is in said wiring block, connects with said wiring block control section through a Y-axis minus side connector, and transmits an address signal to said two or more wiring blocks of Y shaft orientations through a Y-axis plus side connector further, (S) The switch change signal-line group which it is in said wiring block, one side is connected to said matrix switch section, and one side already connects with said wiring block control section, and transmits the control signal of a switch, (T) The X-axis signal feed zone which transmits said control bus signal and data bus signal, and X shaft-orientations address signal to each wiring block which connects with the edge of the X-axis minus direction of said wiring block, and is connected, (U) The Y-axis signal feed zone which transmits Y shaft-orientations address signal to each wiring block which connects with the edge of the Y-axis minus direction of said wiring block, and is connected, (V) XY connection which connects said X-axis signal feed zone and a Y-axis signal feed zone, (W) It is constituted including the interconnection cable which connects said XY connection and a substrate programming control section at the time of the substrate programming control section which sets up connection inside said wiring block each, and a setup of the (X) aforementioned wiring block.

[0016]

[Example] Next, this invention is explained to a detail with reference to a drawing.

[0017] Drawing 1 is the front view showing one example of this invention. Two or more wiring blocks 1-25 to which the universal board shown in drawing 1 was connected in the shape of a (A) matrix, (B) The X-axis signal feed zone 27 connected to the edge of the X-axis minus direction of wiring blocks 1-25, (C) The Y-axis signal feed zone 26 connected to the edge of the Y-axis minus direction of wiring blocks 1-25, (D) The XY connection 28 which connects the X-axis signal feed zone 27 and the Y-axis signal feed zone 26, (E) It has the interconnection cable 29 which connects the substrate programming control section 30 which opts for connection of the wiring block 1 - 25 interior, and the (F) XY connection 28 and the substrate programming control section 30, and is constituted.

[0018] A control bus, a data bus, and the address signal line of X shaft orientations are outputted to each wiring blocks 1-25 connected from the X-axis signal feed zone 27. The address signal line of Y shaft orientations is outputted to each wiring blocks 1-25 connected from the Y-axis signal feed zone 26.

[0019] Drawing 2 is the block diagram showing the configuration of the wiring block of the universal board shown in drawing 1 .

[0020] A wiring block The connector X-axis minus side connector 32 of the substrate section 31 and four edges of the substrate section, the X-axis plus side connector 34, the Y-axis minus side connector 35, and the Y-axis Pros side connector 33, As a signal line on the matrix switch section 38 on the substrate section 31, the switch register section 37, IC socket 40, the wiring block control section 36, and the substrate section A control bus 45, a data bus 46, X shaft-orientations address signal line 41, Y shaft-orientations address signal line 42, the X-axis minus side general-purpose signal-line group 48, the X-axis Pros side general-purpose signal-line group 47, the Y-axis minus side general-purpose signal-line group 49, the Y-axis plus side general-purpose signal-line group 50, It is constituted including the IC socket side general-purpose signal-line group 43 and the switch change signal-line group 44.

(1) Connect with other wiring blocks 1-25 or the X-axis signal feed zone 27, and the X-axis minus side connector 32 holds a control bus 45, a data bus 46, Z shaft-orientations address signal line 41, and the signal line of the X-axis minus side general-purpose signal-line group 48.

(2) Connect with other wiring blocks 1-25, and the X-axis plus side connector 34 holds a control bus 45, a data bus 46, X shaft-orientations address signal line 41, and the signal line of the X-axis plus side general-purpose signal-line group 47.

(3) Connect with other wiring blocks 1-25 or the Y-axis signal feed zone 26, and the Y-axis minus side connector 35 holds Y shaft-orientations address signal line 42 and the signal line of the Y-axis minus side general-purpose signal-line group 49.

(4) Connect with other wiring blocks 1-25, and the Y-axis plus side connector 33 holds Y shaft-

orientations address signal line 42 and the signal line of the Y-axis plus side general-purpose signal-line group 50.
[0021] (5) A control bus 45 becomes effective, when connecting the substrate programming control section 30 and setting up connection of each wiring blocks 1-25, and it transmits the same control signal over the wiring block control section 36 and two or more wiring blocks which were chosen from the substrate programming control section 30.
(6) A data bus 46 becomes effective, when connecting the substrate programming control section 30 and setting up connection of each wiring blocks 1-25, and transmit the same data over the wiring block control section 36 and two or more wiring blocks which were chosen from the substrate programming control section 30.
(7) X shaft-orientations address signal line 41 becomes effective in the place love which connects the substrate programming control section 30 and sets up connection of each wiring blocks 1-25, and when specifying the wiring block control section 36 chosen from the substrate programming control section 30, transmit the same address selector signal over two or more wiring blocks.
(8) Y shaft-orientations address signal line 42 becomes effective, when connecting the substrate programming control section 30 and setting up connection of each wiring blocks 1-25, and when specifying the wiring block control section 36 chosen from the substrate programming control section 30, transmit the same address select signal over two or more wiring blocks.
(9) The wiring block which adjoins the X-axis minus direction, an X-axis plus direction, the Y-axis minus direction, and each Y-axis plus direction, and two or more general-purpose signal lines which transmit a signal between the matrix switch sections 38 are the X-axis minus side general-purpose signal-line group 48, the X-axis plus side general-purpose signal-line group 47, the Y-axis minus side general-purpose signal-line group 49, and the Y-axis plus side general-purpose signal-line group 50. A required signal is transmitted in case the target circuit is formed using this universal board.
(10) Similarly, IC socket 40 on a wiring block 1-25 and two or more general-purpose signal lines which transmit a signal between the matrix switch sections 38 are the IC socket side general-purpose signal-line groups 43, and in case the target circuit is formed using this universal board, transmit a required signal.
(11) The matrix switch section 38 consists of sets of the switch which changes connection between the general-purpose signal line of four directions, and the circuit elements 39, such as IC mounted in IC socket 40 of a wiring block. In case the target circuit is formed using this uni-HASARU board, connection between required signals is switched.
(12) X shaft-orientations address signal line 41, Y shaft-orientations address signal line 42, the data bus 46, and the control bus 45 are electrically connected to the wiring block control section 36, and the programming data of the matrix switch received from these signal lines are transmitted to the switch register section 37 in the matrix switch 38 through the switch change signal-line group 44 from the wiring block control section 36.
(13) The matrix switch 38 switches according to a setup of each switch held at the switch register section 37.
[0022] Wiring of each wiring blocks 1-25 is determined by programming from the wiring block control section 36. The substrate programming control section 30 outputs the same signal to all X locations at the data bus 46 and control bus 45 of all the wiring blocks 1-25 through the X-axis signal feed zone 27 which carries out the branching output of the same bus signal.
[0023] If XY location of the wiring block set up from the substrate programming control section 30 is specified, the X-axis signal feed zone 27 turns on X shaft-orientations address signal line 41 which the wiring block on a corresponding Y-axis location connects, and the Y-axis signal feed zone 26 turns on Y shaft-orientations address signal line 42 which the wiring block on a corresponding X-axis location connects.
[0024] The wiring block which both the signal lines of both X shaft-orientations address signal line 41 and Y shaft-orientations address signal line 42 turn on is specified only one among each wiring block 1-25 by this, and the substrate programming control section 30 sends the programming data of a matrix

switch for the specified wiring block.
[0025] Among [all] a wiring block 1-25, the signal of a data bus 46 and a control bus 45 becomes effective, and only X and the wiring block as which both Y locations were specified incorporate the programming data of a matrix switch to the wiring block control section 36.
[0026] By specifying wiring change data to all wiring blocks, the function as one substrate is realizable by matrix-like the one to wiring block 25 whole.
[0027]
[Effect of the Invention] Since the universal substrate of this invention connects the block with which the electronic-circuitry component was mounted in the shape of a matrix, when the need for the addition of a circuit occurs, it is effective in the scale of a circuit being easily expandable in the range connectable with an X-axis signal feed zone and a Y-axis signal feed zone.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram showing one example of this invention.
[Drawing 2] It is the block diagram showing the detail of drawing 1 .
[Drawing 3] (a) and (b) are the side elevations and rear-face Figs. showing the 1st conventional example.
[Drawing 4] It is the side elevation and rear-face Fig. explaining the amelioration technique of the substrate 101 shown in drawing 3 (a) and (b).
[Drawing 5] It is the block diagram showing the 2nd conventional example.
[Drawing 6] (a) - (c) is the block diagram showing the example of use of the testing device shown in drawing 5 .
[Drawing 7] It is the block diagram showing what improved the testing device shown in drawing 5 .
[Drawing 8] It is the block diagram showing the 3rd conventional example.
[Drawing 9] (a) - (c) is the plan showing the 4th conventional example, a side elevation, and a sectional view.
[Description of Notations]
1-25 Wiring block
26 Y-axis Signal Feed Zone
27 X-axis Signal Feed Zone
28 XY Connection
29 Interconnection Cable
30 Substrate Programming Control Section

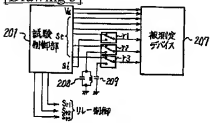
[Translation done.]

* NOTICES *

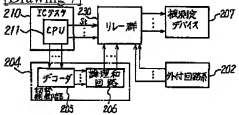
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

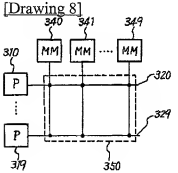
[Drawing 5]



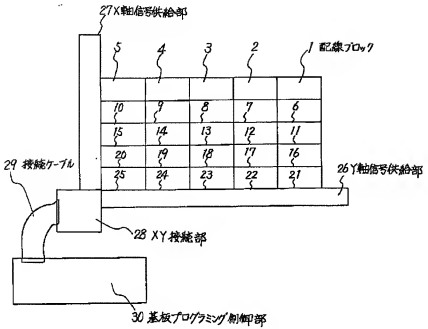
[Drawing 7]



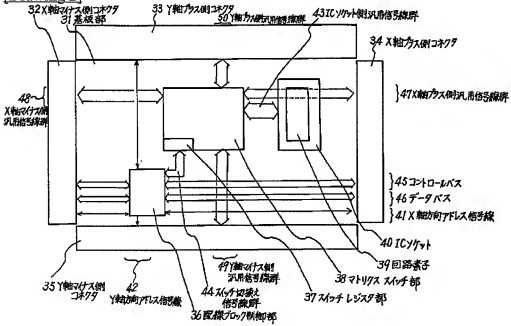
[Drawing 8]



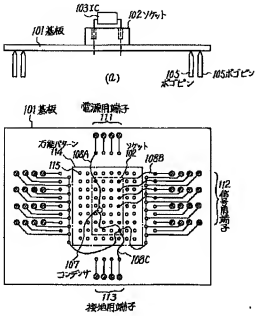
[Drawing 1]



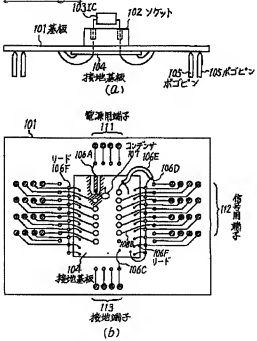
[Drawing 2]



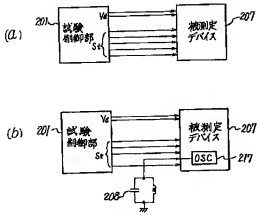
[Drawing 3]



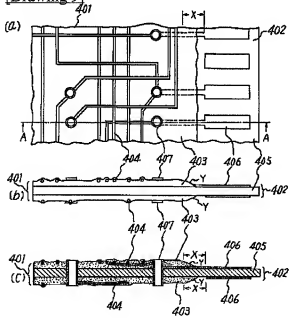
[Drawing 4]



[Drawing 6]



[Drawing 9]



[Translation done.]